



[4910-13-P]

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2013-0867; Directorate Identifier 2013-NM-115-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to adopt a new airworthiness directive (AD) for certain The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes. This proposed AD was prompted by reports of severe corrosion on bonding jumpers installed on the flight control surfaces. This proposed AD would require repetitive bonding jumper inspections for corrosion, sealant disbond, and insufficient sealant coverage, and corrective actions if necessary. This proposed AD also specifies an optional action of doing an inspection for corrosion damage of the bonding brackets, and corrective actions if necessary, which would terminate the repetitive inspections. For certain airplanes, this proposed AD would also require installing certain bonding jumpers and related ground clips and fasteners to the elevators, horizontal stabilizers, rudder, and vertical fin, removing certain bonding jumpers and installing new bonding jumpers, and replacing single-tabbed brackets with two-tabbed brackets. We are proposing this AD to detect and correct corrosion on bonding jumpers installed on the flight control surfaces, which, in the event of a lightning strike, could damage the actuator control electronics (ACEs) and result in the loss of the ability to command individual flight control surfaces or cause uncommanded motion of individual flight control surfaces.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this proposed AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Georgios Roussos, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, Seattle Aircraft Certification Office, FAA, 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6482; fax: 425-917-6590; email: [Georgios.Roussos@faa.gov](mailto:Georgios.Roussos@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2013-0867; Directorate Identifier 2013-NM-115-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

**Discussion**

We have received a report of severe corrosion on 15 bonding jumpers on the ailerons, horizontal stabilizers, and vertical fins of six airplanes that were approximately eight years old. We also received a similar report on an airplane that was approximately seven years old. The corrosion is caused by sealant voids, which allow moisture under the sealant and then trap it inside.

The bonding jumpers are part of the lightning protection ground path for the flight control surfaces that prevent excessive lightning energy from traveling to the primary flight control actuators and then to one of the four ACEs. Corrosion damage on the

bonding jumper connections creates high resistance bonding paths that could, in the event of a lightning strike, potentially expose multiple flight control system ACEs to high voltage transients. The excessive voltage could cause damage to the ACEs and result in the loss of the ability to command individual flight control surfaces or cause uncommanded motion of individual flight control surfaces.

A new category 2 fay seal method has been developed to improve the integrity of the bonding jumper connections. This new method creates a continuous layer of sealant inside and outside of all mating surfaces to keep moisture away from the bonding surfaces and prevent corrosion.

#### **Relevant Service Information**

We reviewed the following service bulletins:

- Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013
- Boeing Service Bulletin 777-55A0010, Revision 1, dated April 17, 2001
- Boeing Service Bulletin 777-55A0014, Revision 1, dated April 1, 2010

For information on the procedures and compliance times, see this service information at <http://www.regulations.gov> by searching for Docket No. FAA-2013-0867.

#### **Other Relevant Rulemaking**

This proposed AD is related to AD 2012-08-13, Amendment 39-17030 (77 FR 24357, April 24, 2012). AD 2012-08-13 requires replacing certain single-tabbed bonding brackets in the airplane empennage with two-tabbed bonding brackets. AD 2012-08-13 also requires, for certain airplanes, installing new bonding jumpers, and measuring the resistance of the modified installation to verify resistance is within specified limits. AD 2012-08-13 refers to Boeing Service Bulletin 777-55A0010, Revision 1, dated April 17, 2001; and Boeing Service Bulletin 777-55A0014, Revision 1, dated April 1, 2010; as the appropriate sources of service information for accomplishing the required actions.

This proposed AD would require inspecting the installation of the bonding jumpers associated with AD 2012-08-13, Amendment 39-17030 (77 FR 24357, April 24, 2012).

#### **FAA's Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

#### **Proposed AD Requirements**

This proposed AD would require accomplishing the actions specified in the service information identified previously, except as discussed under "Differences Between the Proposed Rule and the Service Information."

The phrase "corrective actions" might be used in this proposed AD. "Corrective actions" are actions that correct or address any condition found. Corrective actions in an AD could include, for example, repairs.

#### **Difference between the Proposed Rule and the Service Bulletin**

Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013, specifies to contact the manufacturer for instructions on how to repair certain conditions, but this proposed AD would require repairing those conditions in one of the following ways:

- In accordance with a method that we approve; or
- Using data that meet the certification basis of the airplane, and that have been approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) whom we have authorized to make those findings.

#### **Costs of Compliance**

We estimate that this proposed AD affects 131 airplanes of U.S. registry.

We estimate the following costs to comply with this proposed AD:

### Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspection of bonding jumpers	Up to 67 work-hours X \$85 per hour = Up to \$5,695 per inspection cycle	\$0	Up to \$5,695 per inspection cycle	Up to \$746,045 per inspection cycle
Replacement of bonding brackets	Up to 158 work-hours X \$85 per hour = Up to \$13,430	\$37,928	Up to \$51,358	Up to \$6,727,898
Concurrent cost Boeing Service Bulletin 777-55A0010, Revision 1, dated April 17, 2001	66 work-hours X \$85 per hour = \$5,610	\$2,668	\$8,278	\$1,084,418
Concurrent cost Boeing Service Bulletin 777-55A0014, Revision 1, dated April 1, 2010	21 work-hours X \$85 per hour = \$1,785	\$1,235	\$3,020	\$395,620

We estimate the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. We have no way of determining the number of aircraft that might need these replacements:

### On-condition costs

Action	Labor cost	Parts cost	Cost per product
Replacement of bonding brackets	Up to 158 work-hours X \$85 per hour = Up to \$13,430	\$37,928	Up to \$51,358

We have received no definitive data that would enable us to provide cost estimates for certain on-condition repairs specified in this proposed AD.

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

#### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

#### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

#### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

**The Boeing Company:** Docket No. FAA-2013-0867; Directorate Identifier 2013-NM-115-AD.

#### **(a) Comments Due Date**

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

#### **(b) Affected ADs**

This AD affects AD 2012-08-13, Amendment 39-17030 (77 FR 24357, April 24, 2012).

#### **(c) Applicability**

This AD applies to The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes, certificated in any category, as identified in Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013.



**(d) Subject**

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 27, Flight Controls.

**(e) Unsafe Condition**

This AD was prompted by reports of severe corrosion on bonding jumpers installed on the flight control surfaces. We are issuing this AD to detect and correct corrosion on bonding jumpers installed on the flight control surfaces, which, in the event of a lightning strike, could damage the actuator control electronics (ACEs) and result in the loss of the ability to command individual flight control surfaces or cause uncommanded motion of individual flight control surfaces.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Bonding Jumper or Bracket Inspection**

At the applicable compliance time specified in paragraph 1.E., “Compliance,” of Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013, except as specified in paragraphs (j)(1) and (j)(2) of this AD: Do a general visual inspection or a detailed inspection using a borescope, as applicable, for corrosion, sealant disbond, and insufficient sealant coverage of bonding jumpers; and do all applicable corrective actions; in accordance with Option 1, and Option 2, as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013, except as required by paragraph (j)(3) of this AD. Do a detailed inspection using a borescope if the horizontal stabilizer tips have not been removed. Do all applicable corrective actions before further flight. Repeat the inspection thereafter at intervals not to exceed 48 months. Doing the actions specified in paragraph (h)(1) of this AD on a bonding jumper terminates the repetitive inspections required by this paragraph. Doing

the actions specified in paragraph (h)(2) of this AD terminates repetitive inspections required by this paragraph for that bonding jumper.

**(h) Optional Terminating Action and Termination of Certain Repetitive Inspections**

(1) Doing a general visual inspection or a detailed inspection for corrosion damage of the bonding jumper brackets, and all applicable corrective actions; in accordance with Option 2 of the Accomplishment Instructions of Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013; terminates the repetitive inspections required by paragraph (g) of this AD. Do all applicable corrective actions before further flight.

(2) The repetitive inspections required by paragraph (g) of this AD are not required on the bonding jumpers that were removed, inspected, and replaced with new bonding jumpers and new fasteners using the new category 2 fay sealed direct standard ground stud installation method, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013.

**(i) Prior and Concurrent Requirements**

(1) For Group 1 airplanes, as identified in Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013: Prior to or concurrently with accomplishing the actions required by paragraph (g) of this AD, install new bonding jumpers, and do resistance measurements of the modified installation to verify resistance is within the limits specified in the Accomplishment Instructions of Boeing Service Bulletin 777-55A0010, Revision 1, dated April 17, 2001. Do the actions in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-55A0010, Revision 1, dated April 17, 2001.

Note 1 to paragraph (i)(1) of this AD: AD 2012-08-13, Amendment 39-17030 (77 FR 24357, April 24, 2012), refers to Boeing Service Bulletin 777-55A0010, Revision 1, dated April 17, 2001, as the appropriate source of service information for accomplishing the actions specified in paragraph (h) of AD 2012-08-13.

(2) For Group 1 and Group 2 airplanes, as identified in Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013: Prior to or concurrently with accomplishing the actions required by paragraph (g) of this AD, replace certain single-tabbed bonding brackets in the airplane empennage with two-tabbed bonding brackets, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-55A0014, Revision 1, dated April 1, 2010.

Note 2 to paragraph (i)(2) of this AD: AD 2012-08-13, Amendment 39-17030 (77 FR 24357, April 24, 2012), refers to Boeing Service Bulletin 777-55A0014, Revision 1, dated April 1, 2010, as the appropriate source of service information for accomplishing the actions specified in paragraph (g) of AD 2012-08-13.

**(j) Exceptions to Service Information**

(1) Where Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013, specifies a compliance time after the “Original issue date of this service bulletin,” this AD requires compliance within the specified compliance time after the effective date of this AD.

(2) The “Condition” column in paragraph 1.E., “Compliance,” of Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013, refers to a condition as of the “Original Issue date of this service bulletin.” This AD applies to the corresponding condition as of the effective date of this AD.

(3) If any corrosion damage is found during any inspection required by this AD, and Boeing Service Bulletin 777-27A0078, Revision 1, dated April 1, 2013, specifies to contact Boeing for appropriate action: Before further flight, repair the corrosion damage using a method approved in accordance with the procedures specified in paragraph (l) of this AD.

**(k) Credit for Previous Actions**

(1) For Groups 1, 2, and 6 through 9, as identified in Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009: This paragraph provides credit for actions required by paragraph (g) of this AD and the actions specified in paragraph (h) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009, which is not incorporated by reference in this AD.

(2) For Groups 3 through 5, as identified in Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009: This paragraph provides credit for actions required by paragraph (g) of this AD, except for the actions required for bonding jumpers 21 and 22, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009, which is not incorporated by reference in this AD. If a check of the airplane's maintenance records positively determines that bonding jumpers 21 and 22 were inspected before the effective date of this AD in accordance with Option 1 of Work Package 3 of the Accomplishment Instructions of Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009, this paragraph provides credit for the actions required by paragraph (g) of this AD for the inspected bonding jumpers.

(3) For Groups 3 through 5, as identified in Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009: This paragraph provides credit for actions specified in paragraph (h) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009, which is not incorporated by reference in this AD; provided that a check of the airplane's maintenance records positively determines that bonding jumpers 21 and 22 were replaced in accordance with Option 2 of Work Package 3 of the Accomplishment Instructions of Boeing Alert Service Bulletin 777-27A0078, dated September 10, 2009,

or were replaced using the new Category 2 faying sealed direct ground stud installation method.

(4) This paragraph provides credit for actions required by paragraph (i)(1) of this AD if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 777-55A0010, dated October 26, 2000, which is not incorporated by reference in this AD.

(5) This paragraph provides credit for actions required by paragraph (i)(2) of this AD if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 777-55A0014, dated May 8, 2008, which is not incorporated by reference in this AD.

#### **(l) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (m) of this AD. Information may be emailed to: [9-ANM-Seattle-ACO-AMOC-Requests@faa.gov](mailto:9-ANM-Seattle-ACO-AMOC-Requests@faa.gov).

(2) Before using any approved AMOC, notify your Principal Maintenance Inspector or Principal Avionics Inspector, as appropriate, or lacking a principal inspector, your local Flight Standards District Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD if it is approved by the Boeing Commercial Airplanes ODA that has been authorized by the Manager, Seattle ACO, to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

**(m) Related Information**

(1) For more information about this AD, Georgios Roussos, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, Seattle Aircraft Certification Office, FAA, 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6482; fax: 425-917-6590; email: [Georgios.Roussos@faa.gov](mailto:Georgios.Roussos@faa.gov).

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

Issued in Renton, Washington, on October 15, 2013.

Jeffrey E. Duven,  
Acting Manager,  
Transport Airplane Directorate,  
Aircraft Certification Service.

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